

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claim 1 (currently amended) A vertical machining center having a table arranged below and a spindle head being movable in three mutually transverse axes directions relative to a workpiece, said vertical machining center comprising:

a vertical stocker, which is disposed in the vicinity of a machining area, for stocking a bar workpiece in a vertical direction; and

said spindle head provided with a hand portion which approaches the bar workpiece only in a horizontal direction and grips and releases the bar workpiece,

wherein said spindle head moves between said stocker and said table so that said hand portion transfers the bar workpiece and performs putting and removing the bar workpiece to said stocker and a chuck of said table, respectively.

Claim 2 (currently amended) A five-axis controlling vertical machining center in which an axis of a main spindle rotatably supported by a spindle head is directed in a substantially vertical direction to a floor surface,

a table[[,]] having a chuck, ~~is able to direct~~ adaptable to be directed upwardly, the table

being and positioned and is disposed below a level of the spindle head,

said spindle head is movable in three mutually transverse axes directions relative to a workpiece gripped by the chuck, and said table is driven to be swingable and to be also at least rotatable by a table drive unit, said vertical machining center comprising:

a vertical stocker, which is disposed in the vicinity of the table, for stocking at least one bar workpiece in a vertical direction; and

said spindle head provided with a hand portion which approaches the bar workpiece only in a horizontal direction and grips and releases the bar workpiece,

wherein said spindle head moves between said table and a receiving and discharging position of said stocker so that said hand portion transfers the bar workpiece and performs putting and removing the bar workpiece to said stocker and the chuck of said table, respectively.

Claim 3 (original) The vertical machining center according to claim 2, wherein said table drive unit comprises: a swing drive unit for swinging said table; and a rotational drive unit for rotating the chuck and for indexing the chuck relative to the table, wherein said swing drive unit for supporting both ends of the table in a swingable manner is disposed in front of said vertical machining center, and said table is provided with said rotational drive unit, and said table and said rotational drive unit are swung and indexed at a predetermined position by driving said swing drive unit.

Claim 4 (original) The vertical machining center according to claim 3, wherein when the rotational drive unit is driven while the bar workpiece is turned, the chuck mounted on the table is rotated at predetermined rotational speeds, and while the bar workpiece is cut by a rotating tool, the rotational drive unit is controlled to thereby index the chuck at a predetermined position.

Claim 5 (original) The vertical machining center according to claim 3, wherein when the swing drive unit is driven, the bar workpiece is indexed under the conditions that the bar workpiece is kept in a slanted direction in addition to the horizontal direction to thereby make it possible to perform various turning and cutting operations in a predetermined desired manner.

Claim 6 (original) The vertical machining center according to claim 2 wherein an insertion hole for inserting the bar workpiece is formed in a central position of the table and the chuck, and the chuck is adapted to grip and release the bar workpiece under the condition that the bar workpiece is inserted into the insertion hole.

Claim 7 (original) The vertical machining center according to claim 2, wherein the stocker stocks a plurality of bar workpieces and is disposed by utilizing an upper space of a base of said vertical machining center or an upper space of the table drive unit so that the bar workpiece is indexed at the receiving and discharging position.

Claim 8 (original) The vertical machining center according to claim 7, wherein said stocker comprises: a stocker body provided with an index drive unit for indexing the bar workpiece at the receiving and discharging position; a swivel portion, for swiveling about a swivel axis, mounted horizontally on an upper portion of said stocker body; and a plurality of receiving sleeves fixed on a top surface of said swivel portion and arranged to be directed upwardly in parallel with the swivel axis, wherein the receiving sleeve is opened upwardly and forms a cylindrical shape or a bottomed cylindrical shape, and the bar workpiece is moved in an up-and-down direction in parallel with the swivel axis so that it is possible to insert the bar workpiece into the receiving sleeve and to remove the bar workpiece out of the receiving sleeve.

Claim 9 (original) The vertical machining center according to claim 8, wherein said swivel portion is composed of a semi-circular plate which is cut away linearly leaving a center of the circle, and when the stocker is brought into the standby condition, the index drive unit is driven and then the swivel portion is swiveled about the swivel axis and a linear cutaway surface of the swivel portion is directed in a right-and-left direction so that there is no fear that the spindle head would interfere with the swivel portion, the receiving sleeves and the bar workpieces which are stocked.

Claim 10 (original) The vertical machining center according to claim 8, wherein the index drive unit provided on the stocker body is driven so that the swivel portion is swiveled

about the swivel axis, accordingly an empty receiving sleeve or the receiving sleeve, in which the desired bar workpiece is stocked, is indexed at the receiving and discharging position and is positioned in place.

Claim 11 (original) The vertical machining center according to claim 6, wherein at the receiving and discharging position, the hand portion inserts and removes the bar workpiece to the receiving sleeve indexed at the receiving and discharging position, and when the chuck of the table is directed upwardly and the table is indexed and positioned in place, the hand portion inserts the bar workpiece into the insertion hole and draws the bar workpiece out of the insertion hole from above the table.

Claim 12 (original) The vertical machining center according to claim 2, wherein said vertical machining center performs turning and cutting the bar workpiece and a chuck workpiece other than the bar workpiece.

Claim 13 (new) A vertical machining center having a table arranged below and a spindle head being movable in three mutually transverse axes directions relative to a workpiece, said vertical machining center comprising:

a vertical stocker, which is disposed in the vicinity of a machining area, for stocking a bar workpiece in a vertical direction; and

said spindle head provided with a hand portion which grips and releases the bar workpiece at a position near a center of the bar workpiece,
wherein said spindle head moves between said stocker and said table so that said hand portion transfers the bar workpiece and performs putting and removing the bar workpiece to said stocker and a chuck of said table, respectively.

Claim 14 (new) A five-axis controlling vertical machining center in which an axis of a main spindle rotatably supported by a spindle head is directed in a substantially vertical direction to a floor surface,

a table having a chuck adaptable to be directed upwardly, the table being disposed below a level of the spindle head,

said spindle head is movable in three mutually transverse axes directions relative to a workpiece gripped by the chuck, and said table is driven to be swingable and to be also at least rotatable by a table drive unit, said vertical machining center comprising:

a vertical stocker, which is disposed in the vicinity of the table, for stocking at least one bar workpiece in a vertical direction; and

said spindle head provided with a hand portion which grips and releases the bar workpiece at a position near a center of the bar workpiece,

wherein said spindle head moves between said table and a receiving and discharging position of said stocker so that said hand portion transfers the bar workpiece and performs putting and removing the bar workpiece to said stocker and the chuck of said table, respectively.